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Information Resources on the North American Opossum (*Didelphis virginiana*)

A Bibliography on Its Natural History and Use in Biomedical Research

September 2001

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Information Resources on the the North American Opossum (*Didelphis virginiana*)

A Bibliography on Its Natural History and Use in Biomedical Research

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Cover photo of young opossums in a barrel by Dr. William J. Krause

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Introduction

In recent years there has been a renewed interest in the use of marsupials as unique models for biomedical research (Tyndale-Biscoe and Janssens 1988; Saunders and Hinds 1997). Of these the North American opossum (*Didelphis virginiana*) has received more scientific scrutiny than any other marsupial to date. *Didelphis* has long been a popular animal model among gastroenterologists (Krause and Cutts 1992) and numerous studies concerned with its reproductive biology (Hartman 1952), early embryology (Hartman 1916, 1919; McCrady 1938), histogenesis/organogenesis (Krause 1998a, 1998b), developmental neurobiology (Martin and Wang 1997) and spinal cord regeneration (Wang et al. 1998a, 1998b; Martin et al. 2000) have been published. In addition, *Didelphis virginiana* has played a pivotal role not only in predicting the existence of a newly discovered family of guanylyl cyclase stimulating peptides (guanylin, uroguanylin, and lymphoguanylin) but also was the animal model used in the initial discovery, isolation and purification of the most recent members of this family of peptides, uroguanylin and lymphoguanylin (Krause et al.1998, Forte et al. 1999, 2000). Recently, a small protein known as lethal toxin neutralizing factor (LTNF) was isolated from opossum serum. This factor has been shown to be a potent antidote for several animal, plant, and bacterial toxins. An effective, synthetic form of LTNF has been made so that this peptide can be made in abundance without depending upon the natural source, opossum serum. It is believed that the synthetic form of LTNF may become a universal therapy against animal, plant and bacterial toxins (Lipps 1999, Lipps 2000).

The purpose of this literature survey is to provide an introduction into the literature with regard to the biology of *Didelphis virginiana* and to gather together a variety of studies that have focused on this particular species. Although numerous studies have been published on *Didelphis*, these are scattered throughout a very diverse literature with regard both to discipline and time. The primary aim is to gather these references under one cover as a desk reference for those interested either in using *Didelphis* as a biomedical model for study or in the biology and natural history of this North American marsupial. The bibliography cites the primary references and serves as a guide into the diverse literature where specific topics with regard to *Didelphis virginiana* are most likely to be encountered. The reference list has been restricted as much as possible to *Didelphis virginiana* although some confusion does exist in the early literature with regards as to which actual species was used in some studies. According to Gardner (1973), the genus *Didelphis* contains three distinct species: *Didelphis virginiana* of North and Central America; *Didelphis marsupialis* of Central and South America; and *Didelphis albiventris* of the highlands in South America. Prior to this work, the North American opossum was commonly referred to as either *Didelphis marsupialis* or *Didelphis virginiana*. The references cited in this survey are restricted as much as possible to the North American or Virginia opossum, *Didelphis virginiana*. The earliest reference is Tyson 1698, the latest includes a few references published in 2001. The references have been organized under 43 subheadings to aid the reader in finding specific references with regard to general areas or topics of interest. In addition to published accounts on the husbandry of *Didelphis*, videotape also is available on its husbandry and care as well as the establishment of a temporary-breeding colony for the North American opossum (Krause 1999).

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Useful Websites

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